EXPLOSION AT THE VICTORIA RAILWAY STATION, &c.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT

ON THE

CIRCUMSTANCES ATTENDING AN EXPLOSION

AT THE

VICTORIA RAILWAY STATION, PIMLICO, ON THE 26TH FEBRUARY 1884, AND THE ATTEMPTED EXPLOSIONS AT THE CHARING CROSS, PADDINGTON, AND LUDGATE HILL RAILWAY STATIONS;

BY

COLONEL V. D. MAJENDIE, C.B.,
H.M. CHIEF INSPECTOR OF EXPLOSIVES;

AND

COLONEL A. FORD,
H.M. INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

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1884.

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No. LIX.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT

ON

The Circumstances attending an Explosion at the Victoria Railway Station, Pimlico, on the 26th February 1884, and the attempted Explosions at the Charing Cross, Paddington, and Ludgate Hill Railway Stations;

BY

COLONEL V. D. MAJENDIE, C.B.,

H.M. CHIEF INSPECTOR OF EXPLOSIVES,

AND

COLONEL A. FORD,

H.M. INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

Sir, Home Office, 8th March, 1884.

We have the honour to report that in obedience to your Order (Home Office Papers, A 34707), made under the 66th section of the Explosives Act, 1875, we have held an Inquiry into the causes of, and the circumstances attending, an explosion which occurred in London on the 26th February 1884 at the Victoria terminus of the London, Brighton, and South Coast Railway in Buckingham Palace Road, and the explosions which were attempted at or about the same time at the Charing Cross, Paddington, and Ludgate Hill Railway Stations. In accordance with the above-mentioned section of the Act we beg to furnish the following report:—

Explosion at Victoria Station.

The explosion at Victoria occurred at 1.4 a.m. in the London, Brighton, and South Coast Railway Station.

Character of explosion.

It has been described to us by several persons who were in and about the station, and by others who were at a distance, as having been of a formidable character, resembling the firing of a cannon, sharp and well defined.* It was immediately succeeded by a burst of flame from the gas, which, rushing from more than one fractured pipe, instantly became ignited, and some part of the débris was set on fire. Fortunately the night-watchmen were engaged on the platform adjusting a hose, and were thus able promptly to apply water to the burning débris, and with the assistance of the Metropolitan Fire Brigade the small fire which had been established was readily extinguished.

Station closed at time of explosion.

The station had been closed for the night, the cloak-room having been closed at midnight and the keys handed by the cloak-room porter (Thomas) to the night-watchman (Menning). It thus happened that at the time of the explosion there were very few persons about, the night-watchman and his assistant were on the platform, some shunters were engaged in another part of the station, some cabmen were on the stand in the forecourt, where also was George Rowe, a shunter, who was on his way

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[*] More than one person has testified to having heard two explosions with a well-marked interval between them. But the majority of the witnesses who were in the best position for noticing this point emphatically reject the suggestion that there was more than one explosion; and having regard to the manner in which we may say we now know the explosions were effected, it seems probable either that those persons who state they heard two explosions must have been deceived, or that an echo or reverberation must have been mistaken for a second explosion. The point, however, is really not one of serious practical importance.

home. A few people were passing in the neighbouring streets, including Sergeant Amos of the Metropolitan Police and Mr. Fitzroy Bagot, late of the Royal Artillery.[*]

It thus happily resulted that no loss of life was occasioned by the explosion, and only two persons sustained injury, viz., a night porter (Kattan) and a tinsmith (Fulford), who was outside the station and rushed in to render assistance. Both these men sustained injuries from falling débris.

Description of portion of station where explosion occurred.

The portion of the station in which the explosion occurred is that used as a general booking office, cloak-room, and general waiting-room; and it is separated from the London, Chatham, and Dover Station by a high substantial 18-inch brick wall, without any openings in the same.

This part of the station, the details of which are shown on the accompanying plan (*see* Plate I.), is of light construction, being in fact composed of and divided into rooms by light wooden partitions (as shown on the plan), generally panelled on the lower portion and plastered (and, in the case of the waiting-room, papered) above. The partition which formed the right† side of the cloak-room and waiting-room was distant 2 feet 4 inches from the brick wall which divides the two stations.

The front of the cloak-room and the back of the waiting-room are also of wood; the back part and one side of the general booking office are of light masonry (Plate I.). The whole of this portion of the building was of one storey only, with a wooden and slated roof, provided in the case of the general booking office with a large lantern skylight.

The cubical content of this portion of the station was as follows:—

	Cubic feet.
General booking-office - - -	55,752
Cloak-room - - - - -	16,422·
General waiting-room - - -	11,143
Total - - - -	83,317

Immediately in front of the cloak-room are the steps leading down to the subway to the station of the Underground Railway, fenced with stout iron railings. The whole of the front of this part of the station was covered with a glazed verandah roof.

Particulars of damage done by explosion.

The débris resulting from the explosion had been left undisturbed until our arrival to afford us an opportunity of inspecting it, and we were thus able to note the exact nature and extent of the damage done.

Damage outside the station.

Outside the station itself the damage was almost entirely confined to broken glass, and even damage of this character was limited to an exceedingly narrow area.

So far as we have been able to ascertain no windows were broken at a greater distance from the station than 89 yards ("Windsor Castle" public-house), and it will be seen from the particulars as set forth in Appendix I., and which were collected for us by the police on the morning of the explosion, that even this class of injury was confined to buildings almost immediately in front of that portion of the station where the explosion occurred, and generally within a radius of some 60 or 70 yards.

Damage to London, Chatham, and Dover premises.

The damage in the London, Chatham, and Dover premises, which, as already explained, is divided from the London, Brighton, and South Coast Station by an 18-inch brick wall, was quite insignificant. It is set forth in Appendix II.

Damage to portions of London, Brighton, and South Coast Railway outside the part in which the explosion occurred.

The damage to the portions of the London, Brighton, and South Coast Station outside the part in which the explosion occurred was generally of an unimportant character, and consisted mainly of fracture of glass, damage to ceiling and doors, and slight shaking of the walls in one or two instances, and the smashing of the panel partitions in the Inspector's and Stationmaster's Offices. The details of all damage done to the station will be found in Appendix III.

Damage done to portion of station in which explosion occurred.

Coming to the portion of the building where the explosion had actually occurred, viz., the area occupied by the general booking office, cloak-room, and general waiting-room, we found great destruction and ample evidence of the operation of a very powerful explosive. The iron railings along the side of the steps to the

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[*] This gentleman appears to have been one of the first on the scene of the explosion, and he very obligingly remained for several hours at the station in order to communicate to us the result of his observations, which included, he states, a very decided smell of exploded nitro-compound. Mr. Bagot further added that he has had sufficient experience of the use of this class of explosive to enable him to speak positively on this point.

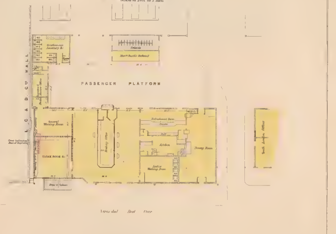
† That is to say, on the right hand of a person standing in the cloak-room and looking towards the front of the station.

Plate I

L. B. & S. C. RY VICTORIA STATION.

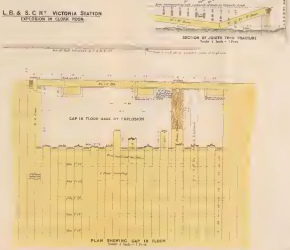
EXPLOSION IN CLOAK ROOM

Scale 16 Feet to 1 Inch



GROUND PLAN OF MAIN LINE OFFICES

DETAILS OF INJURY TO FLOOR AT SEAT OF EXPLOSION



subway had been thrown down, the coping stone into which they were fixed having been turned over on to its side, while seven of the stout iron railings at the end of the steps were broken. The verandah roof, particularly that part of it which was immediately over the cloak-room windows, had the greater part of the glass broken. The front of the cloak-room and the back of the waiting-room were both almost destroyed, having been blown outwards. The partitions which had divided the cloak-room, waiting-room, and general booking office were completely blown to pieces, and the ticket office though not swept away was very considerably damaged. The interior of what had been the cloak-room and waiting-room, and that part of the general booking office which immediately adjoined them, presented an appearance of more or less complete wreckage, which was most marked in the cloak-room and waiting-room, and especially about the junction of the two. The blowing away of the partitions had deprived the roof of its supports, and it had fallen down in a confused mass of more or less broken rafters, boards, and slates. The floor of the cloak-room was piled high with débris of all sorts, including portmanteaus, boxes, and other packages which had been thrown about in various directions. Much of the baggage had sustained serious injury; some of it was almost unrecognisable; much which had escaped the direct effects of the explosion having been broken by the falling timbers of the roof.

In short, the evidences of extreme local violence were quite as noticeable as was the fact already recorded, that considered as a whole the sphere of activity of the explosive, whatever it might have been, was exceedingly circumscribed.

So soon as we had made full notes of the existing state of affairs, and had had photographs taken of the ruined portion of the building, we authorised the clearing up and partial repair of the building, and we personally superintended the removal of the débris from the cloak and waiting-rooms, keeping at hand during the time of such removal the cloak-room porter (Thomas) who had been on duty up to midnight before the explosion.

As the removal proceeded it became evident that the effects were most severe in that portion of the cloak-room which may be described as near the junction of the partition which divided the general waiting-room from the cloak-room, and on the side towards the boundary wall of the London, Chatham, and Dover Station, in fact, close to the angle formed by the right and back partitions of the cloak-room. The portmanteaus and packages as they were extracted from the ruins of this part of the building were in many cases rent to fragments and their contents destroyed, pieces of wood and débris of all sorts were recovered, bearing evidence of having been subjected to a powerful destructive force, and in many instances they had been charred by the fire which had occurred at this part.

Seat of explosion, and character of damage at this spot.

At last the removal of all the baggage and débris from this part of the building, and of some broken wood planking from the wall, revealed the exact seat of the explosion and threw a flood of light on the character of the explosive agent. From a spot about 16 inches from the front of the cloak-room, and extending over a nearly rectangular space about 13½ feet long and having a mean width of about 5 feet (or a total of about 67·5 square feet) the floor planks and joists had been more or less completely destroyed, and two large beams measuring 10 inches by 10 inches had been completely cut in two. (The details of the nature and extent of injury at this part of the floor are shown in Plate II.)

The damage to the floor was not however limited exactly to the irregularly rectangular space of 67·5 square feet, which may be regarded as the crater proper produced by the explosion, but had extended, although in a continually diminishing degree, over a width of floor of some 16 feet, at which distance the planks and one joist were broken* (*see* section of joists through fractures on Plate II.).

A 1¾-inch gas pipe under the floor near the seat of the explosion had been broken at the joint and a powerful escape of gas was at this point. It was evident from the charred condition of some portions of the floor at this part that the escaping gas had in the first instance been ignited by the explosion.†

Turning from the floor to the party wall, we observed that the wood and plaster partition opposite to the injured part of the floor had been completely blown away for a length of 14 feet and a height of 11 feet 6 inches, and the brick wall was thus laid bare over this area. About the centre of this bared space appeared a large "splotch," forming roughly a circle of about 6 feet 6 inches in diameter, with its centre about

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* In all, four joists were clean broken in half, while five others were splintered through.

† The question of whether gas can be ignited by an explosion of so quick acting an explosive as dynamite is discussed in the Report on the explosion at the Glasgow Gas Holder in January 1883, and not only is it there shown that such ignition would be liable to ensue, but that as a matter of fact in that case it did ensue (*see* Report L., 14th March 1883, pp. 15, 16).

3 feet 10 inches above the floor level, opposite, as nearly as might be, to the centre of maximum destructive effect as exhibited by the floor.

This "splotch" had a whitened appearance, as of a sort of "bloom" upon it,* while the surface of the brickwork over the whole of the area and irregularly beyond it was disfigured by that peculiar "pitting" and abrasion which are characteristic of the near action of an intensely powerful explosive, and with which we have unfortunately recently become only too familiar in our investigations of the explosions at Glasgow, at the Local Government Board Office, and on the Underground Railway.† Pieces, in some instances quite minute, of macerated and splintered wood (derived doubtless from the partition) had been driven violently into the bricks.

Conclusions derived from examination of débris and ruins.

The conclusions which followed from the condition and appearance of the floor and wall and surrounding débris, and from the general damage as above described, are clear and unmistakable :—

(1.) The explosion had taken place in the cloak-room.

(2.) The seat of the explosion may be fixed with almost absolute accuracy as having occurred 3 feet 10 inches above the floor, at a spot distant about 3½ feet from the partition between the cloak-room and the general waiting-room, and about 3 to 4 feet from the right side (wooden partition) of the cloak-room, and therefore about 5 to 6 feet from the party brick wall (*see* spot indicated by a cross on Plate I.).

(3.) The explosive agent employed undoubtedly belonged to what may be generically described as the dynamite (or "nitro-compound") class.

(4.) The amount of explosive employed cannot have been greatly inferior to that which had been exploded at the Local Government Board in March 1883,‡ and may reasonably be believed to have been not less than the equivalent of about 20 lbs. of dynamite of the best quality.

Absence of any necessity for examining other possible causes, such as gas.

These conclusions rendered it wholly unnecessary for us to explore further the suggestion as to the possibility of the explosion having been due to an escape of gas or other similar cause; a point to which, up to the time of the discovery of the evidence on the wall and floor of energetic local explosive action, we had deemed it well to devote some attention.

We may, however, state in passing that it would have been easy to show, even in the absence of such evidence, that the effects were not such as could have been produced by a gas mixture even if the accumulation of such a mixture in the particular circumstances which existed had been possible,§ while our inquiries early led us to the conclusion that no other similar cause could be reasonably ascribed.‖

Inquiry narrowed by subsequent discoveries of infernal machines at other stations.

The necessity for elaborate examination and elimination of possible causes other than the cause which is embodied in the foregoing conclusions was further most effectually disposed of by the subsequent discoveries at Charing Cross, Paddington, and Ludgate Hill Stations, to which we shall presently more particularly advert; and those discoveries, taken in conjunction with an important connecting link of evidence to be presently mentioned, relieve us, we conceive, of the necessity for considering other aspects of the question which would otherwise have presented themselves for examination, such as the possibility of the explosion having been due to the accidental ignition of some explosive which was being surreptitiously conveyed in a passenger's baggage for commercial or legitimate trade purposes, or the possibility of the explosion having been the act of some discharged or discontented servant of the Company. Our investigations had proceeded quite far enough in both these directions before they were arrested by the discoveries at the other stations to show us that their exploration could only lead to negative results. We are quite satisfied that it could have been conclusively demonstrated that the explosion could hardly have been accidental; and there did not appear to be any grounds whatever for believing that it was in any way to be referred to the malice of one or more of the Company's servants.

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* Sir F. Abel was good enough to subject some of this "bloom," which had been carefully washed off the wall with distilled water, to chemical examination, but it furnished nothing of value. The washings were found to contain "finely divided carbonate of lime in suspension and *small* quantities of alkaline sulphates, "chloride, and carbonate in solution. These were doubtless derived from the wall itself, and the bloom-like "appearance was due to the deposition of chalk dust raised by the explosion." (Letter from Sir F. Abel, C.B., 1st March 1884.)

† *See* Report L., 14th March 1883, page 15.
Report LI., 27th April 1883, pages 5, 6.
Report LV., 17th November 1883, pages 5, 9.

‡ *See* Report No. LI., 27th April 1883, page 7.

§ Captain Shaw, C.B., Superintendent of the Metropolitan Fire Brigade, expressed to us verbally and quite decidedly on the morning after the explosion his opinion that the effects could not be reasonably attributed to gas, and this opinion he repeated and confirmed in a letter which he was good enough to address to us on the following day.

‖ The question of the possible accumulation of vapour from benzoline or other similar mineral spirit was not overlooked. But substances of this character are not used or stored in this part of the station.

Key to the explosion furnished by the discoveries at Charing Cross, Paddington, and Ludgate Hill Stations.

While we were engaged in inquiring into all the circumstances connected with this explosion, certain discoveries of a most important character were made at other of the London railway stations which furnished the key to the whole affair, and revealed the existence of a most desperate and cruel plot to produce formidable explosions on the same night at a number of the leading stations of the Metropolis; and we shall have no difficulty in showing that the explosion at Victoria was beyond all doubt a part of this plot—and happily the only part which proved successful.

Discovery of infernal machine at Charing Cross Station.

On the night of the 27th February in the course of an examination which in consequence of the Victoria explosion was being made by the officials of the South Eastern Railway of the articles deposited in the cloak-room at Charing Cross station, and especially those packages which from their weight or other cause excited suspicion, a portmanteau of black American cloth fastened with two straps and unlocked, and measuring about 22 inches by 9½ inches by 12 inches (deep) and weighing about 37 lbs., attracted the suspicion of one of the searchers (Chamberlain). The portmanteau, which had been deposited between 7 and 9 p.m. on Monday, the 25th February, was fastened with two straps and was not locked. On being opened it was found to contain some packages or slabs of a peculiar description, and the searcher at once reported the matter to the police, who rightly concluded that the slabs were probably an explosive of the dynamite order. The police caused the portmanteau to be at once conveyed to the Royal Arsenal, Woolwich, and a telegram was sent requesting our attendance.

An examination of the portmanteau showed that it contained (in addition to one or two rather worthless articles of clothing*) 45 slabs of the material which had excited suspicion. They consisted each of a paraffined paper packet 6 inches by 3 inches by ½ inch (thick), containing a substance which proved to be a description of lignin-dynamite not used or licensed for use in or importation into this country, but largely manufactured and employed for industrial purposes in America. Each packet had the words "Atlas Powder A" printed on it, and was open at one end, and weighed rather under half-a-pound. The packets were carefully packed into one side or compartment of the portmanteau and surrounding what proved to be a box of tinned iron, measuring 6 inches by 5 inches by 5 inches, and having the exterior lacquered yellow. The box had a hinged lid, and the junction of the lid and box was roughly luted with a material of the character of cobbler's wax.

Description of firing arrangement.

We proceeded to remove the box and to open it with suitable precautions. In the interior was a circular American alarum clock, face uppermost, and with the alarum bell removed. The clock subsequently proved to be one made by the Ansonia Clock Company of New York, and of the pattern designated by them "Peep of Day." These clocks can be readily purchased retail in London for 10*s*., or even less. On taking out the clock and turning it over we found that the metal back had been removed, and that a small nickel-plated vest pocket pistol (the woodwork of the stock of which had been removed) was fastened by means of copper wire to the movement, and the winding handle of the clock had been turned down and so fixed (also by copper wire) that when the alarum ran down one end of the handle, as it travelled round, would impinge upon the trigger and fire the pistol. This, in fact, had actually been accomplished so far as the impact of the winder and trigger was concerned, the trigger had been pulled, and the hammer of the pistol was resting upon the copper rim-fire cartridge with which the pistol was loaded, and which, on being extracted, proved to have missed fire. The alarum was set to run off at 12 (at which hour the pistol hammer had presumably fallen); the clock itself had stopped at about 4.14. As the arrangement has been fully described in the newspapers and pictures of the same have been published we shall be committing no indiscretion in elucidating the foregoing description with drawings of the clock and pistol (Plate III. (*a*) and (*b*)).†

Circumstance to which failure of machine was due.

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* It is not necessary for the purposes of this Report to specify these. They may form, perhaps, useful ingredients in the police Inquiry, but it appears to us that they do not immediately affect our Inquiry.

† It may be interesting to note that the use of a clock-work apparatus as a means of effecting a deferred explosion is no novelty. Thus the idea was applied in the infernal machines which were surreptitiously imported into Liverpool from America in 1881 (*see* Annual Report of H.M. Inspectors of Explosives for 1881, p. 50), and Thomas' machine, which exploded with such terrible effect at Bremerhaven on December 11, 1875, was fired by a similar agency (*see* Annual Report for 1875, p. 9). There exists also in the Museum of Artillery at the Rotunda, Woolwich, a model of a clock-work apparatus attached to a flint lock for firing a submarine mine or torpedo, which was designed by Sir William Congreve probably in the early part of the present century. But the particular combination adopted in the present instance is, so far as our knowledge goes, original

Opposite to the muzzle of the pistol, inside the tin box and resting against it, was the greater portion of one of the slabs of "Atlas Powder," into which, immediately opposite to the pistol's mouth, were embedded seven powerful detonators,[*] mouths outermost, and by way of further insuring the action of the machine a piece of ordinary quickmatch had been bent into several of the detonators, which, on examination, proved to contain an exceptionally heavy charge (over 13 grains) of fulminate of mercury and chlorate of potash.[†]

This slab was intended to act as the primer, and its function would be to produce (through the agency of the detonator) an initial explosion by means of which the mass of dynamite with which the tin box was surrounded would be exploded.

The dynamite (of which there was in all rather over 20 lbs.) has since been examined by Dr. Dupré, and found to consist of 72·30 per cent. of well purified nitro-glycerine (mean of two samples) absorbed in non-nitrated wood pulp.[‡] (For details of the samples, *see* Appendix V.)

As the strongest dynamite licensed for manufacture or importation into this country contains nominally no more than 75 per cent. of nitro-glycerine, and generally contains a somewhat smaller proportion, it is obvious that the explosive was of a most powerful character, and that the whole package constituted an engine of destruction of a very formidable character, the explosion of which had been averted only by the fortunate circumstance of the pistol cartridge having missed fire.[§]

We may mention that we have since fired from this pistol 20 cartridges of a similar character with only three missfires, two of which went off on the cartridge being turned round and struck on another part of the rim.[‖] (For details of the experiment, *see* Appendix IV.)

Discovery of an infernal machine at Paddington Railway Station.

The same evening we received information that another infernal machine had been discovered in the cloak-room of the Great Western Railway at Paddington (down side), the portmanteau containing the same having been deposited about 5.30 p.m., Monday, 25th February. On proceeding to Paddington to examine it we found an arrangement practically identical in all its main features. The only really noticeable points of difference in the Paddington case were as follows:—

Points of difference between the Paddington and Charing Cross machines.

1st. The portmanteau was made of brown imitation leather; it was locked, and measured 18 inches by 11 inches by 8½ inches.

2nd. The firing arrangement (clock pistol and slab of dynamite containing detonator and quickmatch) were in a japanned tin cash box, from which the tray had been removed.

3rd. The 45 slabs of lignin-dynamite, added to the mutilated slab in which the detonators were embedded and some broken pieces, weighed together 21½ lbs. as against 20½ lbs. in the Charing Cross case.

The dynamite contained 72·53 per cent. of nitro-glycerine (mean of two samples).

4th. The dynamite was distributed in both parts of the portmanteau, instead of in one compartment only, and the intervening flap of the portmanteau had been removed.

5th. The portion of the paper envelopes of the dynamite on which was printed the words "Atlas Powder A" had been torn off in all cases but two.

6th. There were 10 detonators instead of 7. The charge of one detonator (one sample) was 12·7 grains.

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[*] One efficient detonator would have sufficed to explode the dynamite. The employment of seven was simply an extra precaution against possible failure.

[†] The charge for a "treble" detonator, such as is ordinarily used for dynamite, is only about 7½ grains.

[‡] Sir Frederick Abel, C.B., has also, at our request, been good enough to cause a slab to be examined.

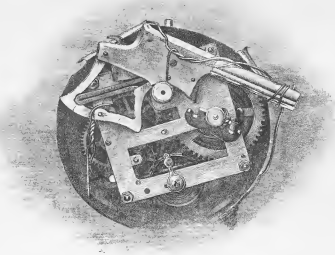
[§] It is, perhaps, scarcely worth while to notice a suggestion that in this case (as in the case of the infernal machines subsequently found at Paddington and Ludgate Hill, and herein-after described) the intention was not to produce an explosion at all, but merely to excite public alarm by depositing machines which were not intended (except in the one instance at Victoria) to go off;—that, in fact, in these three cases the affair was more or less of a hoax. But it may be pointed out that this suggestion cannot reasonably be entertained in view of the fact that the dynamite, detonators, quickmatch, and pistol cartridges were all real articles, and the combination had evidently been prepared with desperate earnestness.

[‖] This is exclusive of two cartridges identical with that with which the pistol was loaded, and of which seven were found loose, in the infernal machine which was discovered at Ludgate Hill (*see* p. 7). These both went off correctly at the first trial.

The particular cartridge which missed fire at the Charing Cross Station has been carefully examined by us, at the Establishment of Messrs. Eley Bros., Limited, Gray's Inn Road, to whom we desire to express our obligations for the assistance which they have been good enough to render us in our Inquiry.

This cartridge proved to be fully charged with powder, and it had also been primed with fulminate, but owing to a minute defect in manufacture the rim did not contain the necessary amount of fulminate to ensure action in this pistol or in two others in which we tried it. Consequently the failure in this instance was due solely to this minute defect of manufacture above mentioned.

Pistol Cocked Ready for Firing.



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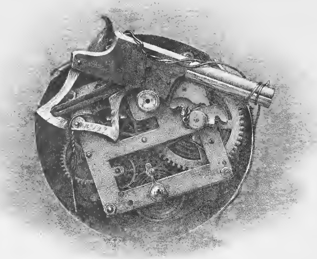
PISTOL FIRED.



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7th. The key winder of the clock (which had stopped at 9.10) had not come into contact with the trigger, and consequently the hammer of the pistol had not fired.

Circumstance to which failure of machine was due.

A careful examination of the clock showed that the failure was not due to any fault in either clock or pistol, but to a circumstance of a most extraordinary and we might perhaps say sensational character.

It appeared that whoever had prepared this machine had fastened down the key handle (by which the trigger was to be acted upon and the pistol fired) in such a manner that in travelling round there was a liability of the edge fouling a very small brass projection, called a "click stud," so as to prevent the handle from completing its travel and reaching the trigger, and this is what had actually occurred. But so inconsiderable was this impediment to the action of the apparatus that when after removal from the portmanteau the clock was taken home by one of us, the key handle being still under pressure of the half-spent alarum spring, and having unavoidably undergone some slight jolting in the cloak-room and during removal, cleared itself and fired the pistol in the course of the night.

It is thus evident that the clock had acted correctly, that the alarum had commenced to run down (doubtless at the assigned time, which in this case also was 12 o'clock) when the fouling of the key handle upon the tiny "click stud" happily arrested it, and the apparatus remained fixed until the slight disturbance to which the clock became subsequently exposed altered the position of the parts just sufficiently to enable the sustained pressure of the alarum spring to overcome the obstruction and to drive round the key handle on to the trigger.

In other words, whereas the pistol was intended to have fired on the night of the 25th, it did not in fact fire until the night of the 28th, after the charge had been drawn and when the pistol and dynamite were no longer together; and this failure or happy retardation of action was due solely to the minute and easily disarranged fouling upon the small projecting "click stud" of the brass finger (so to call it) which was to pull the trigger. The significance of these facts is too obvious and considerable to call for any special comment at our hands.

It will not escape notice also that had the machine not been discovered when it was, or had it been exposed to only a little more jolting in the course of the handling to which before being opened it was almost unavoidedly subjected, the intended explosion would probably not have been averted, but would merely have been postponed.

Discovery of infernal machine at Ludgate Hill Railway Station.

On the 1st March we were requested to proceed to the City Police Station, Old Jewry, to examine another infernal machine which had been discovered that morning in the cloak-room of the Ludgate Hill Railway Station, having been deposited there about 8 p.m. on Monday, 25th February.

On examination we found that the arrangement was in all essentials similar to that of the infernal machines discovered at Charing Cross and Paddington.

Points of difference between Ludgate Hill and Charing Cross infernal machines.

The noticeable points of difference between this and the Charing Cross machine were as follows :—

(1.) The explosive was contained in a black square-mouthed bag, of black glazed leather; it was locked, and measured 18 inches by 7½ inches by 9 inches deep.

(2.) The 45 slabs of lignin-dynamite, added to the mutilated slabs in which the detonators were embedded and some broken pieces, weighed together 21¼ lbs. The dynamite contained 70·71 per cent. of nitro-glycerine (one sample only).

(3.) There were also in the bag (in addition to some pieces of newspaper and articles of clothing*) three unfired pistol cartridges (similar to those in the pistol itself) wrapped up in paper, and four similar cartridges wrapped in another piece of paper; also the metal back of two clocks (similar to those in the machines), the bell, screw, fan and guide ring of the alarum of a similar clock, two alarum hammers, and, wrapped in a piece of newspaper, 47 labels "Atlas Powder A," evidently torn from cartridges.†

(4.) There were 10 detonators (as in the Paddington case) instead of seven. The charge of the detonators (one sample) was 11·8 grains.

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* *See* footnote on p. 5.

† It would appear probable that this was the last machine prepared, and that the conspirators placed within it all the remaining articles and material which they had in hand to ensure their destruction, and thus to get rid of what might possibly furnish the police with dangerous clues. This circumstance is also a further answer to the suggestion that no explosion was really intended to be effected in this case (*see* footnote, p. 6.)

Circumstance to which failure of machine was due.

The cause of failure of the machine in this case was the same as at Charing Cross, viz., the missfire of the pistol cartridge, on which the hammer had descended (presumably at the hour at which the alarum had been set, viz., 1 o'clock). The clock itself had run down at 6.20. On trying the same cartridge again in the same pistol, but presenting a different part of the rim to the hammer, it went off at the first trial. We have since fired from this pistol 20 cartridges of a similar character; nine of the cartridges went off correctly, six did not go off until the cartridges were turned round and struck on another part of the rim, and five failed altogether.* (For details of experiment, *see* Appendix IV.)

For convenience of reference we have tabulated the foregoing details of the various machines as follows :—

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* This is exclusive of a cartridge identical with that which was in the pistol, which was taken from the seven which were found loose in the infernal machine (*see* p. 7).

DETAILS of Infernal Machines found at Charing Cross, Paddington, and Ludgate Hill Railway Stations.

Station where deposited.	When deposited.		When discovered.	Nature of Package.		Explosive.						Alarm set to act at	Clock had stopped at	Cause of failure.
	Date.	Probable hour.		Containing the whole Charge.	Containing clock, pistol, and priming charge.	Nature.	Strength. (Per-centage of Nitro-glycerine.)	Amount	Weight	Detonators.				
										No.	Charge grains.			
Charing Cross - (S.E. Railway.)	Monday, 25th February.	Between 7 p.m. and 9 p.m.	Thursday, 28th February	Portmanteau of black American cloth, measuring 22″ × 9½″ × 12″ (deep)	Tinned iron box, lacquered yellow on outside, 6″ × 5″ × 5″	Atlas Powder A, *i.e.*, lignin-dynamite.	72·30 (mean of 2 samples).	45 slabs and one broken slab (containing detonator) and some small broken pieces.	lbs. 20½	7	13·51	12	4.14	Missfire of pistol cartridge.
Paddington - (G.W. Railway.)	Do.	About 5.30 p.m.	Do.	Portmanteau of brown imitation leather, measuring 18″ × 11″ × 8½″.	Japanned tin cash box, 9¾″ × 6″ × 3¾″.	Do.	72·53 (mean of 2 samples)	Do.	21½	10	12·7	12	0.10	Fouling of key-handle on "click-stud."
Ludgate Hill - (L.C.&D. Railway.)	Do.	About 8 p.m.	Saturday, 1st March.	Square mouthed bag of black glazed leather, measuring 18″ × 7½″ × 9″.	Same as in Charing Cross case.	Do.	70·71	Do.	21¼	10	11·8	1	6.20	Missfire of pistol cartridge.

Unity of design and unimportant points of difference in the three machines. Victoria explosion part of the same plot.

This table shows at a glance both the points of resemblance or identity and the exceedingly small and practically unimportant points of difference in the three infernal machines and in the times of their being deposited.

In view of this unity of design it is obvious that the preparing and depositing of the instruments of destruction formed part of one plot to effect a number of formidable explosions on the night of Monday, 25th February, at certain of the London termini; and, as it appears to us, it would be unreasonable to doubt that the explosion at Victoria Station formed part of the same plot, differing from the other cases only in this, that it unfortunately proved successful. All the surrounding circumstances point to this conclusion and are independent of any particular information or facts of which the police may be in possession.

The coincidence of place and time at which this explosion occurred with the places and times at which the other explosions were intended to have been accomplished, and the fact that the observed effects of the explosion exactly corresponded with what would have been produced under the same conditions by such a charge of explosive as was found in the three other cloak-rooms, must remove all doubt from the mind of every reasonable person that the explosion at Victoria was caused by an infernal machine, practically identical with those which we have described, and deposited doubtless on the same day and under the guise of passengers' baggage by the same gang of conspirators.

Confirmatory evidence of connexion between Victoria explosion and general plot.

But irresistible as is this inference, it is further strengthened and reduced, we submit, to the most absolute demonstration by the fact that in the course of our search of the débris near the seat of the explosion at Victoria we found on the 26th February among many other pieces of metal one which it appeared to us desirable to reserve for careful examination and identification.

The discoveries at the other stations had not then been made, and we therefore did not at the time appreciate the full significance of this article. But directly we had examined the Charing Cross machine we easily recognised it as the main spring and a portion of the key and toothed winding-wheel of a similar clock. This opinion has been confirmed by a practical clockmaker from Messrs. Dent and Co.'s establishment, and also by Mr. Holloway, the London manager of the Ansonia Clock Company. Indeed, it scarcely needs any special knowledge to identify the article, for although having been near the focus of the explosion the parts are much disfigured and the spring itself is discoloured and its temper to some extent affected, it is quite obvious that it had formed a portion of a similar clock. It was at first suggested that the spring might have been part of a clock in one of three cases of clocks which the Ansonia Clock Company had on deposit in the cloak-room at the time of the explosion. But this doubt has been entirely removed by the fact, that although those cases and their contents have sustained some injury, the only clocks of the same character as those which were employed in the infernal machines, and the only clocks which had a spring and attachment identical with that which we have described as having been recovered from the débris, are found to be uninjured. This spring may therefore be confidently accepted as having formed part of the clock which was doubtless used in this case (as elsewhere) to fire the machine, thus furnishing another, although under the circumstances almost superfluous, link in the chain of evidence which connects this explosion with the general plot.*

Conclusion as to cause of Victoria explosion.

Accordingly, we have no hesitation in reporting that the explosion at Victoria Station was accomplished by means of an infernal machine corresponding to those which were discovered at the other stations, that is to say, a charge of about 21 lbs. of "Atlas Dynamite A," exploded by means of the flash of a pistol which had been connected with the movement of one of the Ansonia Clock Company's "Peep of Day" clocks in such manner that at a given time the key-handle revolving briskly when the alarum ran down would impinge upon the trigger and so fire the pistol.

Lignin-dynamite. Previous instances of discovery of lignin-dynamite.

We have already stated that lignin-dynamite is an unlicensed explosive in this country, and the only occasions on which we have come across it in the United Kingdom have been in connexion with infernal machines or attempted outrages. The instances are as follows:—

"Atlas Powder C" in Liverpool infernal machines, 1881.

(1.) The infernal machines which were surreptitiously imported into Liverpool from America in 1881 in the vessels "Malta" and "Bavaria," concealed in barrels supposed to contain cement, were charged each with eleven cartridges stamped in black "Atlas Powder C," and containing a lignin-dynamite composed as follows:—

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* The most diligent search, and even the careful sifting of the débris collected from near the seat of the explosion, has failed to furnish us with any other portions of the apparatus.

Sample 520.

Nitro-glycerine	32·75
Nitrate of sodium	41·75
Wood pulp (unconverted)	12·10
Moisture	13·40
	100·00

Lignin-dynamite at Possil Bridge, Glasgow, 1883.

(2.) The explosive recovered from the abortive explosion at Possil Bridge, Glasgow, in January 1883, consisted of lignin-dynamite of the following composition:—

Sample 948.

Nitro-glycerine	19·2
Sawdust and a little charcoal	75·4
Moisture	5·4
	100·0

Lignin-dynamite at "Times" office, 1883.

(3.) The explosive recovered from the abortive explosion at the "Times" office in March 1883 consisted of a lignin-dynamite of the following composition:—

Sample 958.

Nitro-glycerine	29·8
Wood sawdust slightly charred in parts	63·8
Moisture	6·4
	100·0

Lignin-dynamite in Liverpool infernal machines, 1883.

(4.) The explosive which was found in the Liverpool infernal machines which were seized in April 1883 consisted of lignin-dynamite of the following composition:—

Sample 982.

Nitro-glycerine	70·9
Wood sawdust and a little chalk	24·2
Moisture	4·9
	100·0

Sample 1,069.

Nitro-glycerine	71·6
Wood sawdust, little chalk	24·9
Moisture	3·5
	100·0

Lignin-dynamite ("Atlas Powder A") found in Primrose Hill tunnel, 1884.

(5.) The cartridges which were found lying scattered about the Primrose Hill tunnel in January 1884 were identical with those in the infernal machines discovered at Charing Cross, Paddington, and Ludgate, and the paraffined paper was stamped black in the same way "Atlas Powder A." The composition of the explosive was as follows:

Sample 1,067.

Nitro-glycerine (well purified)	71·82
Fine wood pulp (unconverted)	26·47
Moisture	1·71
	100·00

To these must be added the lignin-dynamite "Atlas Powder A" in the three infernal machines discovered at the London stations. It will be observed that the particular variety of lignin-dynamite known as "Atlas Powder" has only come under our notice on two occasions previous to the present discoveries, viz., in the American infernal machines surreptitiously imported into Liverpool in 1881; and in the case of the cartridges which were packed up in January last in the Primrose Hill tunnel. And in the first of these cases the material was marked "Atlas Powder C" instead of "A," and was of inferior strength, corresponding roughly, as we understand, to that grade of Atlas powder as manufactured in America. It also contained some nitrate of sodium, The cartridges which were found in the Primrose Hill tunnel—and the presence or object of which is not easy to explain—were identical in appearance and composition with those discovered at the three stations.*

On the other hand, Atlas powder is extensively manufactured in America by the Repauno Chemical Co. of Philadelphia, Pa., for commercial purposes, and is sold by authorised agents of the manufacturers in all parts of the United States.

Pistols.

The pistols appear to be identical with a vest pocket pistol manufactured by Remingtons, of Ilion, New York, but these particular pistols do not bear the maker's name, and may have been imitations of their manufacture. The wooden portions of the stocks had been removed to enable the pistols to be fixed into the clocks. They have ·22″ bore American measurement, which corresponds roughly with ·230″ English measurement. The barrels are rifled with three grooves.

Cartridges.

The pistol cartridges were copper rim-fire cartridges, without any bullet (*i.e.*, "blank" cartridges), and containing a small charge of powder, the mouth being closed with a wad, over which was a thin disc of red paper. They are very similar to Messrs. Eley's ·230″ cartridges and to American Winchester ·22″ cartridges, but they are not of either of these makes, but are more nearly or quite identical with the ·22″ cartridges made by the Union Metallic Cartridge Company, Bridgeport, Connecticut, U.S.A.

Detonators.

The detonators contain a charge much heavier than is ordinarily used to explode dynamite, and correspond more nearly to the "sextuple" detonators used to fire "tonite," or similar explosives, than to the "treble" detonators which (in this country at least) are generally employed to explode dynamite.

Times at which the explosions were, perhaps, intended to take place.

As the explosion actually occurred a few minutes past 1 a.m., and as the Ludgate Hill machine had been set to go off at the same hour, and the Charing Cross and Paddington clocks an hour earlier, it is perhaps reasonable to surmise that the Victoria explosion occurred at the hour at which it was intended, and that the plot included the design to effect the explosions at the two stations which were opposite to each other on a line running about N.W. to S.E. at midnight, and at the two stations which were opposite to each other on a line running about S.W. to N.E. an hour later, so as to aggravate the alarm and confusion by producing explosions in opposite directions, and at points remote from one another, at distinct intervals of time.

Possibility as to Victoria explosion having been retarded beyond appointed time by accident similar to that which occurred in Paddington firing arrangement.

It may, however, be worth while to remark that it is not impossible that there may have been some irregularity in the action of the Victoria clock. The cloak-room porter (Thomas) who was on duty on the night of Monday, 25th February, stated to us on the morning after the explosion, and before any discovery of infernal machines or any definite suggestion as to the employment of clockwork had been made, that at or about 10.30 p.m., as he was in the centre of the cloak-room, his attention was attracted to a noise, like the alarum of a clock running down, inside a package. This sound seemed to proceed from some package in the part of the room in which, as we afterwards ascertained, the explosion had occurred. The sound was sufficiently unusual to induce him to place his ear to a box to ascertain what it was. But he could hear nothing further, and was even unable to identify the particular package from which it proceeded.

It is of course conceivable that the noise was due to the ringing of the alarum of a clock in one of the cases deposited by the American Clock Company.†

But against this is the fact that Thomas does not identify the sound as that of an alarum bell. It was, as we understand him, a whirring sound, such as an alarum might produce if the bell had been removed.

In order to clear up this point if possible we carried out the experiment of wrapping up in a coat a clock with alarum bell complete, and one from which the bell had been removed, and without telling Thomas which was which we asked him to inform us which sound most nearly represented the sound which he heard. He unhesitatingly stated that the sound produced by the clock without a bell (which was in fact the clock from the Paddington machine) was exactly the sound which he heard and that the sound produced by the clock with a bell was quite different. He also stated that he was quite familiar with the ringing of an ordinary alarum among clocks deposited in the cloak-room, and would not therefore have been specially attracted by that sound.

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* A material to which the name "Atlas Dynamite" is given was patented in this country in 1880 by Mr. Walter Brierley, on a communication from abroad by Jacob Engels, of Kalk, near Cologne (Patent No. 163, 14th January 1880). Herr Engels is, or was, the Technical Director of Messrs. Krebs & Co's. Dynamite Factory, and the explosive appears to have been brought under the notice of the War Department, and was reported upon by Sir F. Abel, C.B., in 1882. It differs essentially from the Atlas powder and partakes rather of the character of "dualin." It has never been licensed for manufacture in or importation into this country, and, so far as we are aware, has never been brought into the country.

† The manager says that the clocks in these cases, or some of them, would be wound up, and thus in the case of one which happened to have the alarum set for 10.30 the alarum would sound at that time.

We also made the experiment of allowing the alarum of the Paddington clock to run down until it was brought up by the fouling of the key handle on the click stud. Thomas stated that the duration of the sound so produced corresponded with that which attracted his attention in the cloak-room, and this time is far shorter than that occupied by the ringing of an alarum in the ordinary way.

If Thomas is not mistaken on these points, and if in fact the sound which he heard was not that of an ordinary alarum muffled by being inside a package, and so rendered indistinct in character, then it would seem to follow that the sound must have proceeded from the clock of the infernal machine from which (as in the cases of the discovered machines) the alarum bell had doubtless been removed to make room for the pistol.

It will, however, be asked in that case :—

(1.) Why did the alarum act at 10.30; and
(2.) Why did not the pistol go off then instead of 2½ hours later?

In reply to the first of these questions, it may be suggested, either that this particular clock had been (intentionally or otherwise) set to go off at an earlier hour than the others, or (as we are informed by a practical man not unfrequently happens) that the alarum acted before the intended time.

In reply to the second question, it does not appear unreasonable to suggest that there happened here what we know happened at Paddington, viz., that the key-handle fouled on the click stud and held the alarum spring until (as also happened in the Paddington case) the handle ultimately cleared itself,* fired the pistol, and exploded the charge.

If this is what really happened it is obvious that much more serious consequences than those which actually attended the explosion were narrowly escaped, for it is inconceivable that the machine should have exploded at a busy time of the evening, and when the station would be more or less crowded with passengers and officials, without occasioning much loss of life.

Narrowness of the escapes at the three stations where the machines were discovered.

But if in this case the narrowness of the escape be set aside as of too speculative a character to warrant serious consideration, the same certainly cannot be said in the case of the three stations at which the machines failed to explode.

Charing Cross.

At Charing Cross and at Ludgate Hill, as we have shown, a missfire alone averted what it cannot be doubted would in either case have been a disaster of no common order. The construction and the limited cubic contents of the cloak-room at Charing Cross, and the fact that it is situated immediately under the hotel and opens out on a platform where large numbers of persons are generally assembled at the hour (midnight) at which the machine was timed to explode, were conditions which would have been specially favourable to the production of very grave injury both to persons and to property.

Ludgate Hill.

At Ludgate Hill, although the structural damage would probably not have been so serious, the interior of the ground floor of the station could hardly have escaped being completely wrecked, and as the traffic, passenger and other, does not cease until after 1 a.m. (the hour at which the machine should have exploded) some, and possibly considerable, loss of life must have resulted from an explosion at that hour.

Paddington.

At Paddington, as we have already explained, the escape was perhaps even narrower and more remarkable. Here nothing but the fouling of the clock movement on the tiny click stud saved the pistol from going off. This condition of things is one which we satisfied ourselves experimentally is by no means normal to this particular machine or to be reproduced with certainty; and to this very minute circumstance alone we owe exemption from the serious injury to property, and probably still more deplorable loss of life, which could hardly have failed to have resulted from a formidable explosion in the cloak-room at midnight. But in this case the active risk by no means came to an end on the night of the intended explosion. On the contrary, during the many hours which elapsed up to the discovery of the machine on the afternoon of Wednesday the 28th, and even up to the moment on the evening of that day when we opened the apparatus and succeeded in safely removing the cocked and unfired pistol from the neighbourhood of the dynamite, the station, and all those who unsuspectedly came and went on this part of the premises and passed within the sphere of action of the dangerous machine, were really at the mercy of the little stud which held back the key-handle from its intended impact upon the trigger, but held it so lightly and insecurely that the contact was so nearly broken by the slight shaking and concussion to which the machine was unavoidably subjected in handling and removal, as to leave the key-handle sufficiently disengaged wholly to free itself a few hours after the apparatus had been removed from the neighbourhood of the dynamite.

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* *See* p. 7. It is quite possible that the package may have been handled by Thomas during the period which elapsed before the cloak-room was closed, and that in the course of such handling the clearing of the key-handle may have been assisted by some slight jolts; at any rate, there was movement going on in the room and the shaking of the hollow floor due to the receipt and delivery of luggage.

The consequences of the successful part of the plot less serious than they would have been in the other cases.

Lastly, it may not be out of place to observe that the same providential interference with the designs of the cruel and cowardly conspirators who planned these explosions and prepared and deposited the machines is apparent in the fact that of the four intended explosions the only successful one was that of which the accomplishment was the least likely, under the circumstances of hour and place, to be attended with serious consequences.

In reporting on the circumstances connected with these outrages we have confined ourselves as closely as possible to those matters which strictly concern us, and have endeavoured to avoid handling points which more properly belong to the police, in whose hands the further investigation of the matter now rests.

There never was a case which called for more searching and unwearied examination on their part, for a great crime has beyond all doubt been planned and attempted, and the terrible and intended consequences of this crime have only been escaped by a slender chain of what it would be profane to call "accidents."

Our best acknowledgments are due to Mr. Knight, the General Manager of the London, Brighton, and South Coast Railway, and to all the other officials of the Company with whom we were brought into contact, for the invaluable assistance which they rendered to us in the course of our inquiry. Our thanks are specially due to Mr. Banister, the Engineer of the Company, and to Mr. Wright, the Stationmaster at Victoria.

We have the honour to be,
Sir,
Your obedient servants,
V. D. Majendie, Colonel,
H.M. Chief Inspector of Explosives.
A. Ford, Colonel,
H.M. Inspector of Explosives.

The Right Hon. the Secretary of State,
Home Department.

APPENDIX I.

DAMAGE done outside VICTORIA STATION by the EXPLOSION of 26th February 1884.

"Shakespeare" public-house, Wilton Road side	One square plate glass broken over side door in Wilton Road.
9, Stockbridge Terrace	Two squares broken, third floor back.
10, ,, ,,	Two ,, back parlour, ground floor.
12, ,, ,,	One square broken, second floor back.
13, ,, ,,	One ,, third ,,
4, Victoria Buildings, facing Railway Station	One square, second floor.
3, ,, ,, ,,	Three squares, one first floor and two second floor.
1 and 2, ,, ,, ,,	Five ,, two ,, ,, three ,,
Metropolitan Railway Station, facing Railway Station.	Six ,, ground floor.
"Windsor Castle" public-house, corner of Wilton Road and Vauxhall Bridge Road.	One square, third ,,
2, Wilton Road, adjoining "Windsor Castle"	Two squares, one in front and one in back.
3, ,,	One square, first floor.
5, ,,	Four windows blown in.
6, ,, (Cafe)	Six ,, ,, and several gas globes broken.
8, ,,	One window blown in.
12, ,,	Three windows.

NOTE.—Nos. 5, 6, 8, and 12, Wilton Road, the sashes of windows are of one large plate glass, and the force of the explosion forced them inwardly into the rooms.

I called at all the houses in Stockbridge Terrace, Victoria Buildings, and Wilton Road, as far as in a line with the front of Victoria Station, and I was informed that no other damage than that described above was done.

The "Windsor Castle" public-house is the furthest from the scene of explosion, about 89 yards. There was no glass broken or other damage in the front part of Stockbridge Terrace, entirely confined to the backs immediately facing Victoria Railway Station.

C. CHISHOLM, Inspector B.

APPENDIX II.

DAMAGE to LONDON, CHATHAM, and DOVER STATION PREMISES in consequence of EXPLOSION on BRIGHTON COMPANY'S STATION, 26th February 1884.

Custom Officers' Rooms.

Windows in front of station	Three panes of glass broken.
Fanlight over door	Two ,, ,,
Skylight in roof	Five panes of ribbed glass broken.
Brick-built chimney partly down.	

Continental Waiting-Room.

Skylight in roof	Six panes ribbed glass broken.
Ceiling light under roof	Twenty-eight panes glass broken.
Window in front of station	Two ,, ,,
Door of subway	One pane of ribbed glass broken.

Hair-cutting Room.

One China urinal basin broken.	Plastering of wall damaged.

APPENDIX III.

London, Brighton, and South Coast Railway, Victoria Terminus. Explosion of 26th February 1884.

List of Damage done.

Glass destroyed.

Screen at end of station over booking offices	9 squares.
Waiting-room, four windows blown out	16 (large) squares.
Fanlights over doors inside of station	4 squares.
Lavatory facing cloak-room	5 "
Advertising frames, &c. on above	4 "
Superintendent's office stores	2 "
Inspector's office, door and windows	4 "
Excess luggage office	4 "
Refreshment bar near fountain	4 "
Ladies' waiting-room	21 "
Advertising frames in above	5 "
Front of station booking office and cloak-room fanlights	7 "
" windows facing outwards	16 "
" " into booking office	36 "
Lantern light over booking office	76 "
Glass screens "	370 "
Verandah roof in front of booking office	37 "
Front of cloak-room	160 "
Advertising frames in waiting-room	12 "
	792 squares.

General damage to Buildings.

1. Roof over booking office and cloak-room, consisting of heavy framed principals, purlins, king and queen posts, boarding. and covered with slates with lead gutters, hips and ridge (about) 25 squares, nearly all destroyed.

2. Lantern light over booking office, about 12 feet by 16 feet, nearly all destroyed.

3. About 40 squares of heavy framed partitions, in and around cloak-room, consisting of boarding outside and lath and plaster and boarding, paper and colouring inside, all destroyed.

4. About 30 feet by 50 feet floors and joist with bearers fixed on piers and piles, and 1¼ inch floor much damaged.

5. Ceiling of cloak and waiting-rooms, consisting of joists, boarding, and lath and plaster, about 30 feet by 50 feet destroyed.

6. About 600 feet of shelving, on strong upright supports with counters and benches, destroyed.

7. In waiting-room, seven oak seats stuffed and covered damaged; one large oak table damaged, and 12 chromo-lithographs in glazed frames damaged; one large looking glass and two large sashes in walls of cloak-room destroyed.

8 Inspector's office, two lockers and washstand destroyed, and match boarding much damaged.

9. Superintendent's office, partition, about 10 feet by 12 feet, destroyed.

10. Booking office, framed partition near subway, consisting of boarding outside, and boarding, lath, plaster, and paper inside 20 feet by 15 feet, much damaged; partition and walls and plaster and paper much damaged; four pair of doors at exit much damaged; five doors, various, destroyed.

11. Screen round ticket office, about 100 feet by 8 feet, very much damaged and displaced; 90 feet by 7 feet sashes, over ditto, destroyed; 40 feet by 12 feet roof, light over ditto, part destroyed; five ticket cases much damaged, and all the others displaced and slightly damaged; about 100 feet of counter fittings displaced and much damaged, and about 50 feet of shelving destroyed; six barriers at ticket windows damaged.

12. Refreshment room bar, large clock thrown down and damaged, and partition, about 20 feet by 12 feet, plaster and paper, damaged; dining room ceiling slightly damaged, brick wall in larder about 20 feet by 14 feet, much shaken, also wall in cellar, two doors leading to booking office much damaged and a lock forced off.

13. Label case fixed in lavatory and facing cloak-room damaged by broken glass. Note.—This is situated about 55 feet from the spot where the explosion took place, and about 31 feet from where the glass was fixed, another partition being between the place of explosion and glass.

14. Omnibus office very much damaged.

15. Subway, 33 feet of heavy ornamental iron fencing, about 6 feet high, with a gate and lock, &c. complete, destroyed; stone coping of same much damaged, and 18 feet of mahogany hand-rail destroyed.

16. Verandah in front of station, seven sash bars and two ornamental iron brackets destroyed.

17. Ladies room door and screen displaced and damaged, one sash, about 8 feet by 8 feet, destroyed; plaster in room damaged.

18. Exterior, a number of squares of glass broken in Wilton Place, Victoria Buildings, &c.; and on roof of Chatham and Dover Custom House slates are also damaged.

19. Gas pipes in buildings affected, much damaged, and fittings destroyed.

FRED. D. BANISTER,
Engineer.

APPENDIX IV.

TRIAL of PISTOLS from CHARING CROSS and LUDGATE HILL INFERNAL MACHINES.

CHARING CROSS PISTOL.

(*a*.) Cartridges ·230″, manufactured by Messrs. Eley Bros. (Limited).
(Purchased from Mr. Baker, gunmaker, Fleet Street.)

ROUND 1. Fired at *second* trial.
" 2. Fired at first trial.
" 3. Fired at first trial.
" 4. Fired at first trial.
" 5. Fired at first trial.
" 6. Fired at first trial.
" 7. Fired at first trial.
" 8. Fired at first trial.
" 9. Fired at first trial.
" 10. Fired at first trial.

TOTAL.—Nine cartridges fired correctly; one missed at first trial but fired at second trial.

(*b*.) Cartridges ·220″, manufactured by Winchester Repeating Arms Company, New Haven, Conn., U.S.A.
(Purchased from Messrs. Kerr & Co., gunmakers, Queen Victoria Street.)

ROUND 1. Fired at first trial.
" 2. Fired at *third* trial.
" 3. Fired at first trial.
" 4. Fired at first trial.
" 5. Fired at first trial.
" 6. Fired at first trial.
" 7. Fired at first trial.
" 8. Fired at first trial.
" 9. *Missfire* (three trials).
" 10. Fired at first trial.

TOTAL.—Eight cartridges fired correctly; one missed at first and second trials but fired at third trial; one missed fire altogether.

TOTAL RESULT.—Out of 20 cartridges 17 fired correctly at first trial; two missed at first trial, but ultimately fired; one missed fire altogether.

LUDGATE HILL PISTOL.

(*a*.) Cartridges ·230″, manufactured by Messrs. Eley Bros. (Limited).
(Purchased from Mr. Baker, gunmaker, Fleet Street.)

ROUND 1. Fired at first trial.
" 2. *Missfire* (three trials)
" 3. Fired at first trial.
" 4. *Missfire* (three trials).
" 5. *Missfire* (three trials).
" 6. Fired at *third* trial.
" 7. Fired at *second* trial.
" 8. Fired at *second* trial.
" 9. *Missfire* (three trials).
" 10. Fired at *second* trial.

TOTAL.—Two cartridges fired correctly; four missed at first trial, but fired at subsequent trials; four missed fire altogether.

(*b*.) Cartridges ·220″, manufactured by Winchester Repeating Arms Company, New Haven, Conn., U.S.A.
(Purchased from Messrs. Kerr & Co., gunmakers, Queen Victoria Street.)

ROUND 1. Fired at first trial.
" 2. Fired at first trial.
" 3. Fired at *third* trial.
" 4. Fired at first trial.
" 5. Fired at first trial.
" 6. Fired at first trial.
" 7. Fired at first trial.
" 8. Fired at *second* trial.
" 9. Fired at first trial.
" 10. *Missfire* (three trials).

TOTAL.—Seven cartridges fired correctly; two missed at first trial but fired at subsequent trials; one missed fire altogether.

TOTAL RESULT.—Out of 20 cartridges nine fired correctly at first trial; six missed at first trial but ultimately fired; five missed fire altogether.

APPENDIX V.

SUBSTANCE of Dr. DUPRÉ'S REPORTS on Samples of Explosive from Infernal Machines seized at Charing Cross, Paddington, and Ludgate Hill.

SAMPLE 1,187.—ATLAS POWDER (from Charing Cross Infernal Machine).

Sample taken from portmanteau; material contained in paraffin paper bag, forming a slab 6 inches by 3 inches by ½-inch, weighing 3,172 grains. Paper stamped in black, "Atlas Powder A."

Pale yellow, moist-looking material. A well made lignin-dynamite, but nitro-glycerine not perfectly purified. Water does not separate the nitro-glycerine.

It consists of Nitro-glycerine	73·65
Fine wood pulp,* &c.	24·75
Moisture	1·60
	100·00

SAMPLE 1,188.—ATLAS POWDER (from Charing Cross Infernal Machine).

Sample taken from inside of tin box containing pistol-clock, being a portion of the slab in which the detonators were embedded, and which, in fact, formed the primer of the machine.

Pale yellow, moist-looking material. A well made lignin-dynamite, but nitro-glycerine perfectly purified. Water does not separate the nitro-glycerine.

It consists of Nitro-glycerine	70·95
Fine wood pulp,* &c.	26·85
Moisture	2·20
	100·00

SAMPLE 1,191.—ATLAS POWDER (from Paddington Infernal Machine).

Sample taken from portmanteau. Material contained in paraffin paper bag, forming a slab 6 inches by 3 inches by ½ inch, weighing 2,518 grains. Paper stamped in black, "Atlas Powder A."

Pale yellow, moist-looking material. A well made lignin-dynamite, but nitro-glycerine not perfectly purified. Water does not separate the nitro-glycerine.

It consists of Nitro-glycerine	72·65
Fine wood pulp,* &c.	25·59
Moisture	1·76
	100·00

SAMPLE 1,192.—ATLAS POWDER (from Paddington Infernal Machine).

Sample taken from inside of tin box containing pistol-clock, being a portion of the slab in which the detonators were embedded, and which, in fact, formed the primer of the machine.

Pale yellow, moist-looking material. A well made lignin-dynamite, but nitro-glycerine not perfectly purified. Water does not separate the nitro-glycerine.

It consists of Nitro-glycerine	72·49
Fine wood pulp,* &c.	25·77
Moisture	1·74
	100·00

SAMPLE 1,195.—ATLAS POWDER (Ludgate Hill seizure).

Sample taken from inside of tin box containing the clock-pistol.

Pale yellow, moist-looking material. A well made lignin-dynamite, but nitro-glycerine not perfectly purified. Water does not extract the nitro-glycerine.

It consists of Nitro-glycerine	70·91
Fine wood pulp,* &c.	27·49
Moisture	1·60
	100·00

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[*] The portion insoluble in methyllic alcohol and in water is a fine wood pulp, such as is used in paper-making. It is not nitro lignin.

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